Interview with CAPT John H. Ebersole, (26 January 1925 – 23 September 1993) MC, USN (Ret.), first Navy physician to be assigned to a nuclear submarine, USS *Nautilus* (SSN-571), and radiologist participating in the autopsy of John F. Kennedy. Interviewed by Jan K. Herman, Historian, Navy Medical Department, and CAPT Robert Bornmann, MC, USN (Ret.), Lancaster, PA, 7 August 1992.

Herman: I would like to hear a little about your life before you joined the Navy in 1943. Where were you born?
Ebersole: I was born in Sterling, IL, Whiteside County, January 26, 1925. My early schooling--grade school through high school- took place there. I graduated from high school technically in 1942-1943 but I had left for St. Ambrose College down there in Davenport, IA, in January of '43. I enlisted at that time in a Navy Reserve program called V-1. All it really did was promise you that you could finish the semester you were in. So, in June of '43, I was awaiting orders to boot camp at Great Lakes. Instead the orders came transferring me to V-12 at the same college I was at. I went into uniform July 1943 but strictly in an educational program. At that time, I met two men, classmates, who had been submariners. In the V-12 program, there were some people brought back from the fleet for two to four semesters of education before going on to OTC. Harold Swails, who was my platoon commander and his brother Jim(I believe that was his name) had been combat submariners and told a lot of sea stories. That fascinated me. From that moment, I was very interested in submarines--not in diving pressure medicine. When I finished medical school, I took a civilian internship which was sponsored by the Navy. I believe I was paid as an ensign or a JG during that year of internship. During that time, I wrote a letter to the Bureau asking if there was any duty in relationship to submarines. I was sent a great deal of material about submarine medicine program. It did mention about diving school. After completing my internship and having been married for about six months, I reported to the Naval Gun Factory which I believe is the Navy Ordnance Plant now. I spent three months there at the dispensary and then in October I went to Deep Sea Diving School right there at the Naval Gun Factory (Washington Navy Yard), where it is still located, I believe.

Bornmann: No. It moved about 1981 or 1982 to Panama City.
Ebersole: At that time in Walt Willum was the medical officer at deep sea diving school.

Herman: What year was that?
Ebersole: From 1 October 1949 to the end of the year we were there.

Bornmann: That must've been his second tour at the diving school, did he ever mention having been there before?
Ebersole: I can't say. I don't really know.

Bornmann: Because one of the things I get confused was that appearing over a longer period and so I think he must have been there, went off to the Pacific and came back again after the war.
Ebersole: Yes. We didn't meet any other senior medical officer at that time--only Walt. There were four of us--Dobbins, myself, Phillip Newman, and Dick Means. Dick Means is now dead and Phil Newman is now a retired pathologist in Texas and Dobbins is in the Washington area.

Out of the four of us, three, including myself, were USNR. Only Dobbins was regular Navy. He was also the senior man among the group. We went through diving school. Incidentally, I was aware of the fact that diving school was part of the curriculum. When I talked to Dick Arnest, who had been a line officer during the war, he'd made the point that he was not aware that there was a deep sea diving school component to the curriculum. We finished up reasonably successfully in late December and were transferred to New London for six months. Of that six months, four months was in the officers' course and the last two months we spent at the Medical Research Laboratory where Tom Newman was in charged at that time. I asked for duty at New London and got it and was assigned to the Medical Research Lab. Newman and Means went to Hawaii and Dobbins to Key West where we had a submarine base at that time. Again, I bring up the point that I was always more interested in submarines then I was in diving pressure medicine, etc. As a matter of fact, I treated only one case of bends in my professional life. It was cutaneous bends from an escape tank.

Herman: When you were at the research laboratory you weren't dealing specifically with submarines.
Ebersole: That's right. I didn't realize that separation. The submariners felt their squadron medical officer really was with them whereas the Medical Research Lab was way up on the hill. It literally was on the hill physically. I learned in time that they sort of kept their nose up in the air about those of us who were working in MRL (Medical Research Laboratory, Groton, CT). While at MRL, I also worked two or three days at the escape tank. We all rotated through that. Instead of becoming a brillant research worker at the lab, I found myself doing routine physicals, so-called psychological screening for sub school both officer and enlisted. It went fine for a while. I had contact with Carl Shaffer doing a good bit of work on CO carbon dioxide. In time though I became bored and wanted to get closer to submarines. In fact, it was a dream. I wanted to be assigned to a submarine. That was fantasy because in those days a squadron medical officer might occasionally ride a submarine for a few days or perhaps on a special mission but it was a rare thing for a submarine to carry a medical officer for more than a very short period of time. I graduated from the line submarine school that was the 90th class on June 16, 1950. The other time I went to sea after graduation in a submarine for an in ane out five- or six-hour trip, was a group of medical officers who were going through the old Naval Medical School. I think that was a six-month course they were going various places. So we took him to sea in a ASR.

Herman: Do you remember which one?
Ebersole: It would be the one in New London at that time. At any rate, I went with him as their escorting host. But then I decided to go to in a barrel down to the submarine and got back that way. No one else volunteered to go with me.

Herman: You went from the ASW in a barrel to the submarine transferred to the submarine and came back. That was a unique way of doing it.
Ebersole: Came back in a submarine. I did that and one time one of the skippers was kind of enough to take me but those were the only two times I was on a submarine once I got out of sub school. While I was in sub school, we had to go to sea in the things and dive and do all of that sort of thing that you're familiar with. I began to get a little bored with duty at the Medical Research Laboratory. I wrote a letter to BUMED. We had heard some rumors about an

"atomic" submarine. It was a result of these rumors that I wrote that letter requesting consideration for training for the nuclear age. At that time, Walt Willum was sitting in the Bureau waiting for someone to come in and take over. I think Pete Yarbrough was coming in from Pearl. I carefully saved a copy of my letter but I did not save a copy of a classic of Walt's letter. It said we appreciate your interest but our information is that this thing is years away. You can see the year--1951. I would not have leave until my wife and I had a baby.

Bornmann: When were you married?
Ebersole: We were married in October 1948.

Bornmann: How long had you'd known Marian?
Ebersole: At least a year and half at that point. She had been a student nurse. So Walt answered back saying we won't need such a doctor but we appreciate your interest but we're not going to need that for several years. I mentioned my wife and that I was going on leave because I took a "dead horse"(money in advance). We went out to Chicago and visited my folks and stayed at the Edgewater Beach and spent money like drunken sailors. I came back to New London and on or about the 20th of August I got a call from Rickover's office. "I understand you want to be in my project." "Yes, sir." "I want you to think it over for two hours and call me back and let me know." What had happened, here I'm working on speculation. Oscar Schneider, MC, at that point was on Rickover's staff and somehow the information must've gotten from my letter to Willum to Oscar, who put my name up to Rickover. So, I called him back in two hours and said "Yes, I would like to be part of your project." That was in August. I received orders in late September for special training in what was called the Armed Forces Special Weapons Project. That was academically at Reed College in Portland, Oregon and at Duke University. It was to be followed by a period of three months at Oak Ridge National Lab. My initial orders were for Reed College. In other words, completely across the United States I was in New London at that time. At the last minute--almost the very last minute--we were getting ready to have the phone disconnected, when they changed my orders to Duke. So, we went merely to Duke. I was detached from New London on 3 Oct 1951.

Herman: Were there other military medical officers in the course?
Ebersole: Yes, sir. This apparently was the only time that Duke ever held that course. I cannot find anyone else who had been through it, except at the graduate level. We were all post MDs: nuclear physics, radiobiology, statistics, genetics, etc. Then 3 months at Oak Ridge.

Herman: Now, who was at Duke?
Ebersole: Army, Navy, Public Health Service. The Air Force had a large contingent at Reed on the West Coast. We met together at Oak Ridge. Incidentally, among the group at Duke there was Luther Brady who is now the chief of radiotherapy at Hahnemann. He has all the medals in the book from the standpoint of radiology. A number of the class went on to take radiology residencies.
The Army man went on to become an orthopedic surgeon. It was a very wonderful time for me. It was academic at Duke. We were in civilian clothes; we dropped in the NROTC office once a month to pick up our check, and that was it.

Herman: The course was essentially designed for you in your specialties?
Ebersole: Yes.

Bornmann: Was it at the medical School?
Ebersole: Yes.

Bornmann: Taught in the department of radiology?
Ebersole: It was partially at the medical school. I would say we spent the most time in the graduate physics department which was separate from the medical school. Duke had one of the first academic reactors. A little gadget. These people went on to become pathologists. Dr. White was in that group. White was an Army doctor who became a worldwide expert on radiation injury. Most of his professional life was lived at the Armed Forces Institute of Pathology. That was the name I recall for the Army. Upon completing Duke and Oak Ridge, I was sent back to New London Medical Research Lab in May. I reported 22 May 1952 after that ASWOP course.

Bornmann: Was Todd Woeman (?) still there?
Ebersole: No. At that time, Jerry Duffner had moved in. As a matter of fact, Jerry had taken over from Tom before I left for Duke and that was a delightful change without being too insulting.

Bornmann: Where did Woeman go after that?
Ebersole: I'm not sure but I think he had retired and gone work for the Multiple Sclerosis Society.

Bornmann: Did he personally have multiple sclerosis?
He felt that he did and he was told by Jack Kensey(?) that he had the signs of early MS. So, he had a lot of personal problems. So I signed at MRL doing what I had been doing to try to break out. Remember I got there in May 1952. On 23 Dec, I got orders to the National Reactor Testing Station, Arco, Idaho. In the bleekness of December, I left with my family for Illinois and left my wife and two kids there and drove on to Idaho. I got snowed in in Nebraska for about two days. The reactor was really an amazing structure. The engineering crew and officers were all assigned to the Reactor Testing station along with two hospital corpsmen or any resident and a man named Stasou(?). There were no line officers. That is none of the engineering officers were there. Those people who were not nuclear oriented were not there. I spent a full year there with an operating reactor.

Herman: When you got to the facility what did you see?
Ebersole: I said it was amazing, out in the desert. We lived north Idaho Falls so it was 50 miles out into the desert and 50 miles back at the end of the work day. You could drive your own car or you could go by bus. This big circle I'm drawing represents a water tank and down the middle of this had been built a section that was full scale of a submarine hull--reactor compartment, engine room, back in here were the control panels. In other words, we had a full scale mock up of a submarine reactor. The dimensions were exactly the same as would be this right angel structure-- very important medically. It was not sealed up. You could walk up. There were

steps here and steps here. They drove a big turbine out here. There was a big oval over the reactor itself. It was left open all the time. They had to have that to load the reactor and, of course, later on to unload.

There was no shielding on all this. What I was trained in was a field called health physics or radiation safety. I was there the first time this reactor was operated. We ran it low power for a short time and then we whipped it up and had it run for about 90% to 100% a par for the distance it would take us to England and back. People have called it a simulator. It was the actual reactor, the same type the same dimensions that Nawith(?). The shielding was excellent. In those days we used a somewhat different configuration than we use now, but without the shielding there were really no radiation problems. We took measurements and worked out what we had to to measure radiation. I was working with the two hospital corpsmen--fine chiefs.

Herman: What were the dimension s of the tank roughly?
Ebersole: A diameter of the tank would be perhaps 50 or 60 feet?

Herman: Was it a sphere?
Ebersole: No. It was a circular tank, a cylinder. Why the water? The water was part of the shielding which we utilized on the submarine itself. It would always be in the water except when in dry dock. For that year, I mingled with the engineering crew; checked out some systems. I was supposed to learn how to weld stainless steel but I never did.

When it came time to commission the *Nautilus*, it was Mrs. Eisenhower who was there to commission the boat. I decided to fly back a group of enlisted engineers and one officer. Couldn't spare any of the engineering officers, so I had a group of enlisted men in this airplane leaving Idaho Falls to be flown to the commissioning . We got grounded at Chicago at Glenview. Grounded at night, I had the guts to call the commanding admiral and say, "Admiral, you've got to get us to New London."

"No, I don't."

"If you don't get me up, I'll tell you that your pilot flew the Berlin airlift and he just says that he cannot go to New London."

"O.K." We had a couple of days leave in Chicago. That was one of things that happened at that time. We never made it to the commissioning. Now my mother-in-law and father-in-law did and Jack Kinsey (?) acted as their hosts and they had a big time. But, no. We were flown back to Idaho Falls. I don't think the Admiral got my name. I would say just as well.

Herman: I guess it was too late to take the train?
Ebersole: Yes.

Herman: Why did the put the simulator in Idaho? Was it because of the desert?
Ebersole: Yes.

Herman: And who was running it for the Navy ?
Ebersole: A CEC officer, Jack McGarican, Westinghouse, and the Navy. We would see a similar thing in West Milton, NY, with *Seawolf* (SSN-575) and GE. That's a good question. The National Reactor Testing Station, Arco, ID, probably the biggest accumulation of operating reactors in the world. At least it was at that time. There were projects all over: Phillip's

petroleum, Hadwood Zum? as in Material Testing Reactor, Argonne National Laboratory was working on a nuclear powered airplane which is about tops and boondoggles. There were a whole bunch of different projects.

Herman: Why there?
Ebersole: That was the testing range for 16-inch guns that were made in Pocatello, ID, for battleships. At the end of World War II who wanted 16-inch guns anymore. So, it was turned over to the Atomic Energy Commission. It was known as National Reactor Testing Station, Arco, ID. As I said, most of us lived in Idaho Falls. We would either drive our own cars out in the desert or take a bus that left from AEC Headquarters every day. If you took the bus, you divided yourself into two groups, the people who stayed awake and played cards on the way out in the desert and the other ones who slept. I was a sleeper and we kept the card players in the back of the bus. It was Ruff and Warner. As a matter fact, you had headboard heaters in all the Navy cars. The heaters gave the engine some heat while it was parked. There was an electric wire that plugged into the front of the car. I learned a lot there, a lot of engineering. Of course, we had the radiation measurements which were right on but we did not have that submarine sealed. That turned out to be a very important thing. In the midst of this, there had been an accident at the Chalk River Labs in Ontario, Canada. Myself, Buz Colby and one of the officers and enlisted men were sent up the Chalk River to help them recover that reactor. Incidentally, they were doing a lot of materials testing for us in that reactor in Canada. There had been a bad casualty with a lot the uranium going up the stack. There were no great over exposures from it but to get it back on line, Rickover volunteered us all. Jimmy Carter went up with a group from the Seawolf project at West Milton, NY. We followed them. Our cover was we were a hockey team in civilian clothes flying from western Canada to Iowa and now down to the Chalk River. What was I doing with a hockey team? I told them I was the manager. That helped me a great deal in getting across radiation safety because you had to work in a building in complete protective clothing sometimes with positive ventilation and the radiation levels were quite high. We allowed five rems and five rads at that time. You were allowed to get that and you could get it very quickly. I remember I got it in about two days trying to pull spent fuel. I don't think we even allow that much at this point.

Herman: This was at the Chalk River.
Ebersole: Right. The engineers were there, the enlisted men and the officers. They began to get the idea. They were being pretty nonchalant about the thing out in Idaho. But they were now beginning to get the idea that radiation is a problem and there are ways to handle it and we have to learn how. So Chalk River was an important thing. We got back to New London and I was detached from Arco in February 1954 and reported to SUPSHIPS for eventual duty on board *Nautilus*. My fantasy had come true. In getting ready for sea there were a couple of setbacks which were relatively minor. We actually got her to sea in January 1955. Everything from the radiation and engineering standpoints had worked out very well. Radiation exposure was minimal and limited basically to the reactor compartment. Remember we didn't seal it up so the first time we attempted to stay for 18 or 20 hours, carbon monoxide built up very quickly to a 150 parts per million, higher possibly. We had a machine on board which automatically sampled each compartment and read out carbon dioxide and carbon monoxide and oxygen and hydrogen.

I didn't believe it so I had portable testing equipment of my own and the machine was pretty good-- [atmosphere sterilizer?] was called a Mark I.

Now you see that I had goofed in Idaho. All my attention and training I directed toward the measurement of radiation--the preventable exposure. What happened when we got to sea was the non-nuclear contaminants in the atmosphere. Enough thought had been given to remove a little carbon dioxide and provisional oxygen but literally nothing else. Carbon monoxide, much more dangerous then the carbon dioxide, was coming from these things plus other sources still unidentified--some from off-gassing paint or several other sources.

Herman:; How long were you submerged?
Ebersole: I think about 12 hours when I told the old man we were getting about 150 BPM (?).

Bornmann: That's interesting because during World War II combat submarines were submerged for 12 hours frequently. But they weren't smoking(?) because when the oxygen got down you couldn't get the signal (?).
Ebersole: That right. Bob makes a very important point here. We were keeping oxygen right at a nice 21% and the (?) restricted smoking. Forty percent of the crew smoked at that time. I do want to point out that there were other sources. For example, if you took air from the lower reactor compartment, that's the part that was sealed up during operations, you had very high levels of CO. So there were other sources.

Herman: Twenty-one percent was the minimum oxygen level that you would go with?
Ebersole: Yes. We had no reason to go below that at that point.

Herman: But the worst defender was the cigarette smoking.
Ebersole: I think it was number one, the worst offender but there were other sources. Dick Arnaz(?) had pointed that out very well early on on and I confirmed it in the lower reactor compartment. BUSHIPS came through very quickly with a carbon monoxide burner. This is a catalytic agent that chemically converted the CO to CO_2 and we already had a nice gadget to remove the CO_2 called a scrubber. What this burner did was oxidize CO_2 and anything else too. Back in the stern room where this burner was located was a copier (xerox) that used wood alcohol--methanol. Methanol got into this, it was immediately oxidized to formaldehyde. So, we went to the laboratory back there and we solved that with ventilation. We began to see a build up of radon. Radioactivity built up by air sampling.

Herman: What was the source of the radon?
Ebersole: The radium painted dials. The Navy was absolutely lavished with radium. This was originally detected by an MSC, CDR Roycekow (?). While on duty at Mare Island, he took air samples in the buttoned-up submarines in World War II and found terrible high levels of radon and it was from radium painted dials. We had that information at the time we took *Nautilus* and we did see a build up of radon.

After Schneider left, CDR Roycekow went to Rickover. But first, while at Mare Island, he had examined the buttoned-up submarines in the mothball fleet and found these radon levels. We had that information. There was only one answer and that was get rid of the radium.

Herman: And that did it? That pretty much solved the problem?
Ebersole: Yes. There was some you could detect and if you'd sampled long enough there was some from radium painted wristwatches but there was no longer any big radon burden. Another thing we worried about was freon from the air conditioning system. We had 240 refrigant tons of air conditioning on board to the engine room which was a big surge of heat. The freon would break down into hydrochloric, hydrofloric acid, chlorine, flourine at any point where it saw high temperature. We would see terrific corrosion on arm shirts (?), any place you had a spark. We had to have air conditioning. Our air conditioning crapped out on us one time. Back in the engine room, I didn't want those guys on duty for more than 30 minutes at a time. It was really hot for about 25 or 30 minutes. We had to have air conditioning. The same thing happened on *Seawolf* except even worse.

After I was detached from *Nautilu*s I went to *Seawolf* because a medical officer decided he would no longer volunteer. The problem was even worst there with freon. I should point out that while I was in Arco, ID, with the engineering crew there was a similiar project going on for the second submarine, *Seawolf*. There were entirely different plants. *Nautilus* was a pressurized water reactor, the type that we have a TMI (?) today. It worked fine but delivered saturated steam to its turbines. The idea with *Seawolf* was that we would use liquid sodium as a means of removing the heat from the reactor. This would allow us to do sort of a double pass system and get super-heated steam. The initial medium for the super heater was to be mercury. That, thank God, never really got to fruition. Mercury would have been a deadly toxic element in a submarine, particularly hot mercury-- mercury vapor. Instead [we used] a utectic--that is a mixture that at room temperature is liquid. Sodium-potassium was to be the intermediate. Sodium to cool the reactor. The sodium-potassium mixture to furnish the super heating in the boiler. With super-heated steam we are in the modern age. Saturated steam is a little primitive but there were terrific metalurgical problems with MAC--the super heaters. In fact, when *Seawolf* went to sea, she went to sea with saturatured steam and therefore was no better than *Nautilus*. There were some terrific advantages whereas *Nautilus* had to have 16-inch pipe reactor coolant, *Seawolf* had 6-inch.

Bornmann: But *Seawolf* did go to sea with sodium?
Ebersole: Yes.

Bornmann: But she was decommissioned...
Ebersole: She was decommissioned in June 1959.

Bornmann: And her reactor...
Ebersole: Her reactor was replaced with a pressurized water reactor. I know further attempts were made to utilize sodium as far as the Navy was concerned. There are sodium-cooled plants.

Bornmann: Where?
Ebersole: Washington.

Herman: Are these power-generating plants?
Ebersole: Plutonium manufacture, I think.

Herman: Hanford [WA]?
Ebersole: Yes. Hanford. So with *Nautilus* I got a good dose of the fact that there was an atmospheric problem and there were solutions being found gradually. It was difficult to get across some of these concepts. We were breathing this air, not for eight hours–an occupational exposure– but for 24 hours a day. *Nautilus* did succeed in staying down eventually for a couple of weeks at a time but that was about all. When *Seawolf* came on line and her medical officer had bowed out, I volunteered for it. They said, "Fine, if you get a relief." That is when Dick Dobbins relieved me on *Nautilus*.

Bornmann: You had two skippers on *Nautilus?*
Ebersole: Yes. My skipper was Gene Wilkinson and Bill Anderson relieved him.

Herman: Did Wilkinson ever take it to sea?
Ebersole: Oh, yes. He was our first skipper. Anderson, however, was the one that took her to the North Pole with Dobbins as medical officer.

Herman: Were you on that North Pole voyage?
Ebersole: No. I had been detached from *Nautilus* to *Seawolf* in December of 1955. So I had barely a full operational year on *Nautilus*. Dick Dobbins relieved me there after taking the course at Reed College in Portland. While they were making the polar trip, *Seawolf* was out making a stab of staying down for two months--60 days--no snorkle, no contact. We could receive by sending up an antenna but not send...and of course we said we were vaguely somewhere off Iceland. We did, in fact, for the first time on *Seawolf* in August 1958, stay down for 61 full days. By that time there were considerable improvements. First of all, we got rid of that one-quarter inch copper tubing that was a freon problem and, under radio vibration, would easily break. Secondly, we had a new source of oxygen--not new; it was used in World War I--old chlorate candles. In burning a chlorate candle, you release oxygen so we were able to use our own oxygen for about half the time and about half the time we were on these candles.

Herman: Did you manufacture oxygen in any other way but using the candles?
Ebersole: We had our oxygen supply which lasted for about 30 days had proven that earlier but we needed something else if we were going to stay down for another 30 so we'd burn these candles. You literally burn them in a furnace, a little stainless steel cylinder and the output contained oxygen. It also contained a lot of chlorine. A hospital corpsmen I had with me suggested a solution. He had worked in a laundry and removed chlorine with photographic hypo--sodium thiosulfate. We took the output of the furnace, bubbled it through a hypo solution. In fact, we had a lot of photographic hypo on board for the film badge program. We got rid of the chlorine and that was an oxygen supply.

That, of course, was a record at the time to stay down for 60 days. It was a few years later before *George Washington* (SSBN-598) stayed down, I think, for a full 90. We did that in 1958. I think the *Washington* didn't become active until the '60s. The real objective of this was that we could stay on station with a ballistic missile for 90 days. We were the first one to at least go the two months.

Herman: Were there any atmospheric problems down there for that 60 days?

Ebersole: No. They were pretty well solved by that point. The carbon dioxide removal systems had been improved. That's an example, however, of how a solution may become a problem. The amine--monoethanolamine--that was used in the scrubbers had a characteristic; all the amines did. The greater the volatility, the more efficient they were removing the CO_2. So we had some of the amine coming over into the atmosphere and nobody knew anything about its effects on humans. We had a toxicology unit set up at NMRI Bethesda to do some quick work with chickens and one other species. Actually, the levels never got very high. The output in the scrubber was in the engine room and, unfortunately, near the reactor control panel. We had to watch that really carefully. The freon problem was pretty well solved. The old man did not let them do any painting. I should say in the mist of all this, hydrocarbons were testing very high. You know the Navy if you walked you saluted, stand still you painted. The last thing before going to sea would be a paint job which gave horrible hydrocarbon level. Incidentally, the skipper, Dick Landing's, father was a medical officer and his brother a medical admiral, said no painting. So, for the first time we had relatively low hydrocarbon levels in the atmosphere. The carbon monoxide problem was solved. I would look for certain other things--phosgene, mercury, macompass(?) and I found no trace of those things. We would take a high volume of samples, seal them up in canisters, and bring them back to them for analysis. They were a very great help. It was decided to decommission *Seawolf* , and that was when I applied for residency.

Herman: Was there an incident that provoked the decision to decommission *Seawolf*? Had they had an engineering problem?
Ebersole: Yes. It was the metallurgical problem that kept us from using super heaters that was really the basic thing. In other words, here was the second submarine having great promise to be much faster than the first, and much more efficient. Moreover, you were riding around with liquid sodium in your belly and remember what happens to sodium when it hits the water. So it was decided on a level much higher than mine to decommissioned her and put in a water cooler reactor. I personally felt that was a mistake and that we should have kept at least the one sodium cooler reactor running. The French have gone on with that technology for power reactors as well as an enhancer. But it wasn't my decision to make so the ship was decommissioned in June and I went over to MRL for about a month or so and then started my residency in Bethesda in radiology.

Bornmann: Was George Bond at NSMRL in 1959?
Ebersole: Yes. I think George was there. I really had very little to do--just some odds and ends teaching.

Bornmann: George took over from Vogule(?)
Ebersole: I don't know how that ran. Jerry left of course and as I remember George was officer-in-charge at that time. I was there only about a month or so. Some odds and ends of teaching and a couple of reports had to go in. Then of course my residency at Bethesda. After my residency I stayed on there. During that first year of residency, I had a lot of traveling--to a meeting in Paris, a medical meeting in Germany for lectures, Sweden, Norway, and a lot of talks around the country. So I asked for my residency to be extended a year because I'd been away a lot during that first year.

Herman: But your submarine days were essentially over at this point.
Ebersole: Submarine days were over. I had thought seriously of going back to the boats after I finished my residency. As a matter of fact, I went to the point of buying a second car--a Karmann Ghia--in order to keep my family in Bethesda and to travel down to Norfolk for new construction. At the last minute, I was offered to head up the radiological therapy division and took it. I was never disappointed about it. Then I retired from the Navy in 1970. That just about covers the submarine thing except for my interview with then CAPT Rickover.

Herman: I was going to ask you about your interview with ADM Rickover much earlier in the interview. How did that encounter go?
Ebersole: I remember I came back to New London from Oak Ridge in May of 1952. Sometime in the fall, Rickover called me down for an interview and it was the classic interview in that it was set up for Friday afternoon. I had a ticket for a football game in Philadelphia that I was going to catch on the way back. He changed the interview to Saturday afternoon. I had to find a place to sleep that night and I bunked with Deep-Sea Diving School on a mattress. Rickover's first question was: "What do you think you can contribute to this project?" I said "I don't know enough about your project to say what I could contribute." That probably got me in. If I had said, "Oh, I could do this or do that... or "Are you ready to go?" Well he said, "You go to Idaho Falls today."

"I'll try to make out."

"Well, you don't have to," he said, "but when you do get out there, I don't want any of this medical nonsense. I want you to learn about stainless steel. I don't want you being a doctor." "Yes. Sir."

"The AMA is just a labor union anyhow."

I said, "Well, you could view it that way." That was my interview, and it occurred around September 1952. I didn't actually get orders to Arco, ID, until December, two days before Christmas. I often wondered what he was trying to do. First of all, he wanted to know what my class standing was in medical school. I didn't know what it was; they didn't tell us. "Stupid medical school," he said. That sort of thing went on.

He came out to Arco one time on a visit. It was on a Sunday and I was home in Idaho Falls. I got a call. "Come on out; the admiral is sick." Suddenly he was an admiral. During the interview and all that business he was a captain. I took a look at him. He had pharyngitis. It was fairly moderate; no big deal. I gave him a shot of penicillin. Your looking at the only hand that ever slapped the buttocks of ADM Rickover. He called me up 2 days later after he got back to Washington and said he didn't go get another shot, as I had suggested.

"I didn't do that and I didn't die."

I said, "Good. Are you better?"

"Yes. I'm better." We had contact with him from time to time. When he came to the ship, he would always take band-aids. He wanted packs of band-aids. He must of had a collection of band-aids. He was a character in every way.

Bornmann: You were the first medical officer to go into nuclear submarine medicine?
Ebersole: That's correct.

Bornmann: Dick Dobbins was the second?

Ebersole: Yes. He relieved me on *Nautilus*

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Bornmann: Do you know whether he volunteered?
Ebersole: I had to do the work on that. Dick had, at that time, come back from Key West and was assigned to Deep-Sea Diving School. Remember the deal was that I had to find my own relief and it had to be approved by Rickover, his people, and the skipper. Only then was it okay for me to go to *Seawolf*. I wanted *Seawolf* because I knew she was going to attempt long submersions whereas *Nautilus* never would. The polar trip only took about 5 days of submergence. I went down and I talked to Dick. I said, "Hey, here's a chance to really get it." and so I talked him into it. He went out to Reed College and was assigned to *Nautilus*.

Bornmann: He became a radiologist later. Was he interested in that area at the time you talked to him?
Ebersole: Not particularly.

Bornmann: So this was a career marker for him. It stimulated his interest.
Ebersole: Right.

Bornmann: Who was the third and fourth?
Ebersole: Dick Arnest(?) who was on *Skate* (SSN-578) and somewhere along the line Jack Sholte(?) went to Reed. Of course, they all went to Reed after that one shot at Duke. I think it was Jack Sholte.

Bornmann: Jack Sholte went to Reed. He also went to the University of Cincinnati for occupational medicine.
Ebersole: That was a year later.
Bornmann: That was just before he relieved Jerry Duffner at BUMED; that would have been 1962 or 1963. But Jack Sholte was on a nuclear submarine?
Ebersole: Yes, I don't know which one. *Skate* was the third one on the line. That was Dick Arnest. Then there was one we lost, the *Thresher* (SSN-593). *Thresher* was initially Dan McGrew, I thought [?] but I don't know what the order of battle would be in that. Harry Davis had to twist Jack Sholte's arm to get her in the program.

Bornmann: When they contemplated the fleet of Polaris submarines with continuous submergence with blue and gold crews and a doctor for each one. They then faced the situation where they had to have 35 to 60 submarine medical officers. The recruiting problems became really difficult.
Ebersole: Remember that was Harry Davis' constant complaint when he was in the Bureau when I interviewed him in Phoenix.

Bornmann: Hal Davis was not the first doctor to bail out of the training program. I think in 1958 they had somewhat of a small revolt up at the sub school where the doctors said, "Hey we volunteered to be squadron medical officer. We didn't volunteer to spend half the year submerged on a submarine."

Ebersole: That could be. I was completely out of it at that point. I had a feeling that we really didn't imbue these guys or give them equipment perhaps to look for the problems. There's still a problem with those things--atmospheric problems. I don't know what happened during that period. To me, riding those ships was the place to be. That's what the problem was. We were breathing the stuff 24 hours a day. We didn't get a lot of back up from BUMED, MRL, or anyone else. We'd roar and scream in letters. I had a situation where right or not I communicated directly with BUMED; didn't necessarily go through COMSACATLANT or anything else. I knew the surgeon general and I was raising hell. We did not get the response I would have liked to see us get. That, more than anything else, is why I left submarine medicine. You had a bunch of guys sitting behind desk twiddling their thumbs and not bringing these problems up front. I would not have liked to have been on a Polaris mission where the carbon dioxide was 1.5 percent when it should have been down around .5.

Were they getting those readings regularly?
Ebersole: That was the design specification for the CO_2 scrubber--the 1.5 was based on a 30-day, tied up alongside the pier in New London--"Operation Hide Out."

Bornmann: Were you at New London during "Hide Out?"
Ebersole: No, I was in Arco, ID. I never saw a report on "Hide Out." I was simply told that as a result of "Hide Out," the scrubbers would operate at 1.5 percent CO_2. There's nothing terribly bad about 1.5 but mix it up with everything else--a little low oxygen, carbon monoxide, hydrocarbon, a little freon--the degradation products. It was a little bit too much. I kept haunting at that. In fact, our average CO_2 on that 60-day dive was 1.3 percent. We were able to get it down fairly well there but in the life of the dive, only a half percent.
You understand how these things work. BuShips does not pick these numbers out of the air. They ask the surgeon general what is the design (?). The surgeon general goes to MRL, now called NSMRL (Naval Submarine Medical Research Laboratory) in New London, and they do a project and they come up with a science report that says 1.5 is acceptable. If they had said .5, the people at BuShips would have screamed and hollered and said, "That's 100 million dollars! Is it really necessary?" All the surgeon general had to say was: "Hey, I'm responsible for the health of the sailors. That is the figure. They would have said, "Okay. We'll go to Congress and get 100 million dollars." It is a circuitous thing and that was the decision that was made which I think was modified later.

There's an old story about how the Germans got the Tiger Tank. They built a gun first. Then they built a tank. We built a tank and as an afterthought stuck a gun in it. The German gun was the 88 millimeter. What I think may have happened is that Mare Island worked on the scrubbers and looked at a variety of things. I think they may have had some help from the Navy Research Lab also. They wanted to use amine that had relatively low volatility but it wasn't very effecient. So, when this 1.5 figure came through they had to go to a more volatile aminoethanol), which was eventually used on *Nautilus* and *Seawolf* . I don't know what happened later. The 1.5 percent may have come through after the fact, after the actual engineering and scrubbers were done. I don't know that.

Bornmann: But someone had to bless it.
Ebersole: Yes, that's right.

Bornmann: You see it nowadays with the EPA with OSHA, the Occupational Safety Health Adminisrtation, with the doctors, the laborers, the bankers; everybody has their say and a consensus is found so I'm not happy but I'll except it.
Ebersole: I also dealt with BuShips. Let me make clear, too, that Rickover didn't want any part of this atmospheric thing. I would bring these problems in and he would say, "I've got enough to do with this building program." That's another part of the BuShips deal with them. I dealt with a fellow whose nickname was Red; I can't come up with the last name right now. (I had meant to say something about [Lawson P.] Red Ramage before we finish up today.) So I was in communication with BuShips and BUMED and of course the BuShips people were a little bit embarrassed by some of these things. I didn't get a lot of coorperation there, and BUMED really knew what to do. And Rickover would not get involved in this.

Bornmann: Did he pretty much leave you to your own devices then. He just said I don't want to know. You just take care of the problem and leave me out of it. Was that the attitude?
Ebersole: No. "Report to me these things but I'm not going to remember anything about them. I've got too much on my mind." And indeed he did. By this time, he had a whole program under way for a nuclear fleet but he could have kicked a little rear end I think. The story about Red Ramage: Early in the game while I was back at New London, we begin to get a little bit worried about open battery ventilation.

Bornmann: This was in diesel submarines?
Ebersole: Yes. We began to think there'd be open battery ventilation. We had a battery on *Nautilus* and *Seawolf* as an emergency power supply to keep that reactor cool. Certain parts of the charging cycle of a battery it may give off arsine--arsenic hydride and stibine antimony hydride. The antimony is deliberately put in the plates for stiffening but this was a possible problem. So, we had open-battery ventilation on boats in Norfolk. Jerry said go down to Norfolk and get a bunch of urine samples and we'll look at arsenic. I got in an airplane and flew down and make a visit to the commodore of the submarine squadron who was Red Ramage.
The commodore said, "Why are you here?"
"Commodore, I'm here to get some urine samples from open-battery ventilation boats to see if this will be a problem on the atomic submarine."
"Oh, you'll never get that thing to sea." Within three years he was sitting in my laboratory back on the *Nautilus* saying he had always been behind this project.

Bornmann: He was SUBLANT then?
Ebersole: I think he was SUBLANT or something in Washington. He was still on active duty when he wrote us. I've run into him several times since but I've never reminded him of that. He always intimidated me a bit. That was some of the things we went through.

Bornmann: What did you find out in the urine?
Ebersole: There were some occasional flashes of arsenic but there were seafood eaters--oysters and so on-- in the Norfolk area. No, nothing significant, Bob. There were one or two that showed a little arsenic and they ate big seafood meals--oysters in particular.

Bornmann: The syphon seafood picked up a lot of heavy metals.
Ebersole: Apparently, yes, clams, oysters and so on. Not that I think this is of any importance but when we finally got to sea, I might say, we did not use open-battery ventilation on our chargers and we didn't use a finishing rate. These hydrides appeared only on the finishing rate.

Herman: Explain finishing rate.
Ebersole: Finishing rate is when you're charging a battery on a submarine, huge flood acid battery, you apply a certain amount of amperage but at the end to top it off you increase the amperage of a voltage to I forget what it is. But during the finishing rate at charge you would bottle these gases that are pretty nasty.

Herman: That would take care of the cases at that point?
Ebersole: Yes. In fact, we didn't go into a steep curve that finishing rate. We didn't get any of the hydrides. I was testing for them routinely. Another interesting thing-- phosgene. We ordered some hand sampling phosgene tubes from Germany. In other words you'd squeeze a valve four times and look at the color change and this chemical. At once you broke an end of the glass valve off and put the valve in your... Of course this came from Germany who would label it phosgene. They refused to deliver it to us at Electric Boat. A hospital corpsmen had to strap on a .45 and he and I went down to the post office in New London to get these phosgene indicators. That sort of thing went on all the time.

Herman: Just because it said phosgene on it they thought it was. . .
Ebersole: Phosgene detector but they didn't read the “detector.” Another thing. Very early in Idaho we learned that surgical gloves were ideal when working with contaminated equipment. The engineers could feel things. When I got back to the ship and they were outfitting it, I asked for several hundred pairs of surgical gloves. I got a very nice official letter from Bayonne, NJ. "How many surgical operations do you contemplate aboard this ship?"

We had to do a lot of different things. For example, equipment wise I had this little laboratory on board to do radioactive stuff and I went down one day and here a CP79 counter scaler. This is the Navy's counter scaler-- this high, this wide-- and it took up a big space and wasn't worth [anything]. So, we got a commercial nuclear Chicago counter scalers.

Bornmann: What is a counter scaler?
Ebersole: To count radioactive samples. We could put to counter scalers nuclear Chicago in the space occupied by this monster the Navy had. Later, they modified it but we got rid of it. The commercial equipment could be mounted on shock mounts and worked out ideally. I wanted a spare counter scaler. That was our business. Without a counter scaler or PM tube. We had a spare that way. We had one on the line and one we could always plug in for air sampling, sampling of the primary coolant and all that sort of thing--shield tank water, etc. The inadequacy of a great deal of the Navy equipment at that time had not kept up with what we were about to do. The Navy came out with a beautiful gamma measuring device, actually beta also, ANPDR27 Fox. Prior to that the equipment was quite clumsy. The 27 Fox I got on *Seawolf* and it was a rugged Geiger-Muller tube in a shield and it really held up well. We did not have any good neutron takers in those days. I had to go commercial with those and none of those were any good--they

were all gamma sensitive. We had an episode on *Seawolf* of a possible neutron leak. Fortunately, it wasn't but the thing that I was using was gamma-sensitive and we did have a gamma leak which was taken care of very quickly but equipment was a problem. Here again there's no one to blame. We moved faster I think than anyone had contemplated in getting a ship actually to sea that performed better than specification. All of sudden, it came as a surprise to most people to find a nuclear powered ship.

Bornmann: It's a complete introduction of a new engineering system into operation and we had the same thing when we went to large-scale helium diving. The civilian engineering was not adequate to cope with helium. It leaked through every valve, every pinhole, every gasket. Just the problem. They made a decision to put stimulators. They said we can train corpsmen to use stimulators. We need to have a stimulator in every sick bay. Simple decision. It took about five years to go back, check the curriculum for training corpsmen, get all the independent duty corpsmen cycled through a training program, get BUSHIPs to analyze the electrical situation on board a ship because its not the same as a hospital. All this preparation for just a decision to put in a cardiac stimulator. They went through that in introducing nuclear propulsion which opened a whole new vista of submarine operations. Things that had been visualized as long ago as the 19th century by Jules Verne. It's like space flight also. If we're going to have somebody isolated, everything they need has got to be with them or thought of and taken care of.

Ebersole: We had a bunch of submarine people who wanted to have a good war against the Japanese. But they were stodgy and as opposed to anything new as any group I've ever known. I brought up one name to date. That's one. We had to fight tooth and nail for every little thing we needed and without Rickover we wouldn't have done it. Rickover was not a nice man to work for but he did the job when I don't think anyone else could have done it. But we had to fight tooth and nail for a long time and in the process when we finally got her to sea I think we got a bit arrogant. I know we all were to some extinct that way.

Bornmann: What I think is fascinating is that in this newly developing field, people were attracted by the challenge and who worked for a moment--but after 5 or 7 years of it you said, "Hey, this is exhausted." They were the people who would see what was needed and go in and argue and fight and sneak around obstacles, do moonlight requisitions on all sorts of levels in order to get what was necessary. Now, 30 years later we accept it. It's hard to understand the problems that they had because the solution has been in place now for over 20 years.

Ebersole: That's very well said.

Herman: I'm a little intrigued with your connection with BUMED and saying essentially that you worked independently even though you were making requests from them. Did you get any support at all from them and if so what kind?

Ebersole: I'd get letters back.

Herman: You'd get letters but that's it.

Ebersole: And the marvelous thing that might happen in the 20th century--a battery that would generate oxygen at one end and pick up carbon dioxide at the end. That was something that was far off in the future with no immediate solution. I have to make an exception there. I think that the Navy Research Lab, NRL, gave me a great deal of support because they would come down and they'd ride us and they'd see there was or believed that there was a problem.

Bornmann: Did the toxicology unit at Bethesda give you much support?
Ebersole: Yes. They did, particularly with amine. They came through with a nice study, on amine.

Bornmann: That was Dr. Siegel?
Ebersole: Jack Siegel. Jack Siegel had set this up for 24-hour exposures on animals, which was what we asked for not 8-hour on occupational exposure. Jack did a nice job and I specifically would mention the monoethanol amine study. He got it to me fast. He used very high concentrations we didn't encounter. He found CNS problems in chickens or mice.
Why did I leave the boats? I wanted to take a third one out and do construction. Harry Alvis wanted me to shuffle paper at a squadron level or beyond. A nuclear squadron--squadron 10 I think it was--was opposed to that. I said they hell with that. I want to get back in clinical medicine if that is the alternative.

The problems are not completely solved yet, at least to my way of looking at it, they were not. I wanted to ride another new construction boat. No, we need you for squadron medical officer of Squadron 10 and not spend time at sea.

Herman: So that really made up your mind to get out of boats.
Ebersole: Yes.

Herman: You knew that the best part was over for you.
Ebersole: Yes. For me it was over.

Herman: The time you spent on *Nautilus* and *Seawolf* were really experimental periods. They were operational but then again they weren't operational. They were experiments.
Ebersole: Yes. These were in a sense experimental boats. We didn't get into a real class. We didn't get into a real class until we got to *Thresher*.

Bornmann: Every one was a specific design problem and they would try it.
Ebersole: We must not forget Jim Stark in that early order battle. Jim Stark rode the *Triton* (SSRN-586) with Beach [Edward L.]. *Triton* had two reactors--one port and one starboard. She was built with money attained because she would be a good radar ship. At that time, with the bureaucracy in Washington, you could get money for radar early warning detection. *Triton* was supposed to sit out in the middle of the ocean with her radar mast up detecting any incoming missiles and what not. So, *Triton* was built but it was really experimental--two reactors, port and starboard. Rickover was tuning up, I think, for a carrier at that time. Many of us were thinking in terms of a service ship. There was something different about *Skate* (SSN-578). I think it had a single screw. But those ships were experimental in an engineering sense. I think only with *Thresher* did we get to the idea of here's the *Thresher* and we want a class like her.

Herman: How long were you at the Diving School at the Navy Yard?

Ebersole: I spent three months as a general medical officer at the dispensary and then three months at Deep Sea Diving School for a total of six months in Washington. It was the only time I ever had quarters, by the way. I had quarters for the first couple of months right over the old entrance gate.

Herman: The Latrobe Gate. I think they're still apartments.
Ebersole: I could have them for only two months because there was a lieutenant commander coming in who was promised the apartment but he wouldn't be there for two months. So, my wife and I were able to move right into that. I shouldn't say that was the only time because during submarine school you were furnished quarters on the base. We also had quarters there when we came back from Idaho. We were given quarters for a short term until we could find housing on the base.

Bornmann: You had another association with EDU because I was at the school, I think, in 1964 when they had the fire. I don't know whether you were the command duty officer or what, but John Veil said that you were the one he talked to when he said he had two divers with smoke inhalation in the chamber.
Herman: There were fatalities in that fire.
Bornmann: Yes, two died and the two who went in to rescue them got trapped and were rescued but they had smoke inhalation. After they had a Table 4, they were transferred to Bethesda to be watched and treated. John Veil, who was our MSC administrative officer, apparently contacted you and you made arrangements for them to be received. Do you remember?
Ebersole: I really don't, Bob. I guess what I would do would make arrangements to have them admitted in pulmonary medicine. I really don't recall that.

Bornmann: You were a celebrity, I know, because I had met Jerry Duffner in the spring of '60 and he asked me if I wanted to come into the submarine medicine program. Since I was in a two-week reserve training course at Bethesda he said that I should call you to see what you advised me. You probably don't remember but it's the first time I ever met you. I went by your office and talked to you for some time. I still remember your answer. You said when you are on the submarine and have a patient, tell the corpsman the diagnosis and that he needs penicillin and the corpsman would handle it. He would do everything--treating, make the necessary entry report to Washington. The hospital corpsmen in the nuclear program were absolutely outstanding. I finally succeeded in getting Ernie Reisinor I believe. But, so many enlisted men were commissioned in those early details. We tried as hard as we could for an MSC but we were never able to carry it off. However, I did get a warrant for Ernie Resinor who later on retired and worked for then the AAC(?) and inspected me at Bethesda. The submarine service has had an outstanding group of young men as pharmacists mates with the advance of the new fleet submarine design.
Ebersole: I think you're right. The idea of *Seawolf*, for example, I told you about passing the chlorine gas through a bath of hypo that came from a hospital corpsmen, I can't remember his name now but I will eventually. We were recommended for a lot of things.
After the Seawolf business, the skipper recommended me for the Legion of Merit and this went up through COMSUBLANT who approved it. He highly recommended it and it went up to

COMLANT who was McCormick and he wrote that this doctor was only doing what doctors are supposed to do--and therefore was not recommended. So, that left a little bad taste. But those early hospital corpsmen were excellent. Incidentally, Rickover picked those at the same time he picked the engineers.

Herman: He picked the corpsmen?
Ebersole: Well, he asked for corpsmen and somebody must've picked them.

Bornmann: They had to be interviewed and be selected from the interview process.
Herman: Did he do the interviewing for the corpsmen?
Ebersole: I think he did. Those people went with the engineering crew. The hospital corpsmen were selected before me for *Nautilus* and they were selected before the skipper, the executive officer, and so on. So, I met up with them first, outside Pittsburgh Westinghouse fabricated the reactor at Shippingport [PA] or somewhere around there. They wanted to get me down there to see it before they shipped it to Idaho for that simulated submarine. On this Westinghouse property, there was an old brick building which was used as an engineering school for the enlisted people. When they started to modify it in the classrooms, they found hundreds of telephone lines which had been bookie's joint. That's where I first met up with my hospital corpsmen. I spent a couple of days there and I got to see the core reactor. It was really dramatic. They had it up on a platform with lights shining on it. This was before any reactor at poliar object (?) that was shipped out to Idaho and became the Mark I reactor. The Mark II went into *Nautilus*.

Herman: Was that a plutonium or a 235 reactor?
Ebersole: That was an enriched uranium reactor. It probably would've, in time, generated some plutonium but it was basically an enriched uranium reactor, TMI-type.

Herman: During the process of learning all of this, you learned what the engineers learned. So, you became a specialist in reactors as well as a physician.
Ebersole: Basically, except I never learned to weld stainless steel.

Herman: You never learned to weld but that was the only thing you didn't learn for you learned everything else, and the corpsmen the same thing.
Ebersole: Right. The corpsmen were very much on top of things. In the case of *Seawolf*, one or two hospital corpsmen assigned to me became chief of the boat (COB) in a short time. COB is the leading enlisted man of the ship and knows all aspects of it.

Herman: So he has dolphins just like everybody else.
Ebersole: Yes. He has his dolphins, and I was assigned another hospital corpsman. He was close to retirement and wanted to be COB at least once before he left.

Bornmann: That's very unusual. Most of the time, they do not pick a corpsmen for all sorts of reasons, starting with the Geneva Convention. I don't think it's a good idea. But if the doctor who was serving needed stainless steel welding, he could tell the corpsman to do it.

Herman: You mentioned also that you were on the lecture circuit for a while. What were some of the subjects you were talking about and what kinds of groups were you speaking to?
Ebersole: Everything from rotary clubs to the NATO medical meeting in Paris. I gave them broad outlines on how the reactor operated cartoon type. I did not give them landing information. I also talked about radiation exposure which all the groups were interested in. In December 1956, I went to England to speak to the Royal Society of Medicine. At that point I made a tour of England because they were interested in having their own nuclear submarine at that point and they had questions about how to train the hospital corpsmen. Their so-called sick bay attendants were IQ wise down here. If you couldn't do anything else you became a sick bay attendant. These hospital corpsmen were doing a really high tech work. So, I was sort of a consultant to his majesty through Frank Ellis who was liaison in this country. So, I was on a lecture circuit. In began to get a bit burdensome to the point where the first year of my residency when I was away from the boat there was a pretty high demand and that's the reason I asked for an extension on my residency for a year when I was at the end of the third year.

Bornmann: Was the radiotherapy unit your idea or did it just happen to be developed at the time you finished your residency and you requested to be part of it and were picked to direct it?
Ebersole: It was in existence under Dick Cain who was the pioneer who set up the isotope lab at Bethesda as well as the therapy side. It was in existence. When I retired in 1970 and came up here, radiotherapy was new. I was the first one to utilize it here in Lancaster.

Herman: Was the USS *Seawolf* the last boat you were associated with?
Ebersole: It was my last ship.

Herman: Then you went into radiology and that was at Bethesda.
Ebersole: That was at Bethesda. Initially it was to be a 3-year residency in general radiology which included in those days a year of radiation therapy. Because I was away so much that first year on the lecture circuit, I asked for an extension. So, I really had a 4-year residency.

Herman: When we had lunch some time ago, we talked about Dr. [John H.] Stover [commanding officer, Naval Medical School]. During that very historic year--1963--you said you had taken the radiographs of Kennedy.
Ebersole: That was the Kennedy autopsy. At that time I was acting chief of radiology. The chief of radiology was at a very important meeting in Chicago, the Radiological Society of North America. So, I was acting while he was away. When we got the word from Dallas of the President's death, I asked CAPT [Robert O.] Canada, who was commanding officer of the hospital at that time, if he wanted me to stay around. He said, "Oh, yes. Be there." So, I was in the inner morgue when the body was brought in. In fact, I helped lift in onto the autopsy table. What was very clearly obvious was a wound of entry in the back and then an exit wound to the head. The problem for me was to find the bullet that caused the entrance wound in the back. We didn't see anything in the front as an exit wound. We thought a tracheotomy was done and was rather neatly sewn. The FBI or Secret Service said, "Run x-rays head to toe." The x-rays head to toe showed no slug. "Do it again," they said. So, we did it again and still no slug. So, we proceeded with the

autopsy. This was a classical textbook wound of entry in the back, 3 or 4 centimeters to the right at T-4. And as Jim Hughes, the pathologist, traced the course of this bullet, it went up over the right lung, bruised it, and came out here. Dallas had cleaned it up for us. So, there was no second bullet in the body. This caused a lot of problems. We didn't close the autopsy room off; we had agents, White House aides, and other people in and out. I remember, in particular, an Air Force aid.

We speculated about this saying, "If there's an entrance there's got to be an exit." Non-medical people heard us speculating about this. The x-rays were showing no slug. So, finally with communication with Dallas, what we should have done initially, we found out there was a wound of exit through the throat that they had cleaned up. To get back to the very important part of this, about halfway through the autopsy, Pierre Finck, a forensic pathologist at AFIP (Armed Forces Institute of Pathology) who helped during the autopsy. As Jim [James J. Humes has just recently in JAMA gone through the business of the wound of entry makes--a bevel it's called. Let me explain that. Let's say this is a skull. It has an inner bone and an outer bone. Always in the case of the skull, the wound of entry always makes a bubble. This loop is what I mean by a bevel. This always happens. The wound of entrance always has that appearance. Then it rattles around the skull and explodes out. So, you can't say much about the wound of exit. It's massive and horrible. But that's what I mean by a bevel. Pierre, Jim Humes, and [J. Thornton] Boswell were absolutely 100 percent correct when they said that this bevel back here in the temporo occipital region definitely shows that the bullet came from from above and behind. Believe me, all you have to do is see a wound of entry once in soft tissue like a back. All the rest of them are alike. They're well defined almost like a purple pansy, purplish-red color, very little bleeding. They are very distinct as compared to the surrounding skin and that's exactly the way that wound in the back looked.

So, after telephone communication with Dallas we were able to establish that 1) this wound of entry back here had a corresponding wound of exit up at the throat. Probably, he was hit in the back when its forward here and it came right out. He might have survived that by the way. He might have, but nobody could survive the head wound, though. It was massive destruction of the brain. But, this part was very clearly demonstrated on the fragment bones we had and I don't see what all this conspiracy crap is about. It came from above and behind which is where Oswald was. It was a high velocity bullet.

Herman: You saw all of this?

Ebersole: Yes. I was there for the entire autopsy except for those periods when I would go from the morgue to Tower Four to have the x-rays developed. I would be gone for approximately 10 or 15 minutes at a time. The rest of the autopsy was non-informative. My job was to provide for the Secret Service or whatever a bullet that appeared to be within the body because they had a wound of entry and no wound of exit, and I couldn't find it. There was a little oberg(?) shot in the appendix where the diverteculum(?). That was the only entire thing in the body except for metal fragments in the skull. Now, those x-rays are in the Archives. I went down there a few years ago. We were all called in to attest that those were in fact the x-rays that we took and I put a medal seal on each x-ray. That was my part in the Kennedy autopsy. I think if we had to do it over again we would do things a lot differently. I think we would have gotten immediate communication with Dallas. We would have closed the morgue off to everybody except the medical people directly involved so they wouldn't hear this normal background chatter that goes on between pathologists.

Bornmann: Then you would have had conspiracy theories because you locked them out and therefore you were plotting some cover.
Ebersole: I did not testify at the original Warren Commission. There was really nothing for me to say. The pathologist took care of it very well, but I was asked to come down and testify at the later Senate Subcommittee hearings when they reinvestigated the deaths of Martin Luther King, RFK, and JFK. At the end of the time, my recommendation was that we have a pool of forensic pathologists who rotate the duty, and that when I say assassination, we fly that duty pathologist to the site. That was part of our problem but I think this recent thing that Jim Humes did was great. To me it's exactly as I remembered. Pierre had trouble getting in because the Marines kept him out, but he was there. He had given lecture to us residents on this question of the bevel long before the Kennedy autopsy.

Herman: You had said something about later on you had seen your x-rays. You had used a ruler to measure. What was that all about?
Ebersole: Several people looking at the x-rays in the National Archives had seen grease pencil marks and lines. They immediately jumped to the conclusion, including a famous professor from Johns Hopkins, that these were an attempt to mark off the line of the flight of the bullet. This is crap because I received a call from then CAPT [James M. Young], who was a White House physician, some days after the autopsy. They wanted to get some measurements of the diameter of JFK's head for the sculptor who was the to sculp the bust in front of the Kennedy Center. So, they made the x-rays available to me at the old State House and I took a grease pencil and measured various diameters. Now those were taken with a portable x-ray machine. So, they're not true measurements but I wanted to get the true measurements by drawing a line between the anatomical points and measuring it, writing it down, then going back to Bethesda and making the correction that had to be made. When you take a portable x-ray, particularly when you're close to the body, you have a lot of distortion. You'd have to get the tube way off before you got rid of that distortion. So, I went back and we calculated the correction factor and I called CAPT Young (it should be in the White House tape somewhere). We had agreed that his measurements were off by some number like 2.19 multiplied by 2.19. That's what that was all about and yet someone had seen those x-rays and said, "Hey, those nuts are trying to draw a line in the path of the bullet and it's off." Indeed it was off from the path of bullet. It was an anatomical measurement. That was probably the only amusing thing about the autopsy for me.

That White house physician we called Jim but I think his name was Fred Young. Did you have a question about that?

Herman: The reason I brought it up is because since the making of Oliver Stone's "JFK," the National Archives has been deluged with requests to see the x-rays and other things. Because the Navy was involved, it ends up in my office. The latest request to come through my door was from someone writing a book and wanted to have access to the photographs. Apparently, from what I understand there's a law suit on the way to release the photographs from the Archives and put them in the public domain. Apparently there not in the public domain right now. There in the Archives and you need special dispensation to get your hands on these photographs. They have traced how the photographs ended up in the

Archives to begin with. They were taken in the autopsy room by Navy photographer John Stringer.
Ebersole: I know him very well.
Herman: He took the photographs. The Secret Service took the camera and everything. They developed the film and I think the Warren Commission ended up with the pictures. When the Warren Commission finished with them they went back to the White House. The White House turned them over to the Kennedy family figuring they should have these photographs. The Kennedy family turned them over to the National Archives with the stipulation that they not be released for so many years.
Ebersole: I can't give you the provenance on the x-rays. I turned them over to Secret Service the night of the autopsy. I don't know what happened subsequent to that. I remember when I went down to the Archives at the request of the archivist. They had the x-rays there, all I could account for that I knew had been taken. It was to those x-rays that I affixed a medal tab and gave the date and so on. That's all I know about the x-rays.

Herman: It's just one of those curious things. It will probably be around for years. I was curious because Dr. Stover had mentioned it. He was skipper of the medical school at the time and was there. I asked him if he saw anything particularly out of the ordinary. He said no.
Ebersole: I've had a couple of would be "authors" contact me. I just refuse to talk because the things have been twisted and turned all sorts of ways. I had one gentleman who implied a threat. "I used to be a policeman. We're going to take care of you in this book if you don't help us." I hung up. What I'd really like to see is Jim Humes coming out in that article in JAMA. That's way overdue.

Herman: Was it the Oliver Stone thing that really prompted him to decide it was time to clear the air?
Ebersole: That and all the books that have been written about it.

Bornmann: I agree with you that the best thing in the Navy for a medical officer is to work in an organization run by line officers with a clearly defined objective and then contribute something uniquely medical to the attainment of that objective. Have you reflected on submarine medicine in the 1980s and 1990s? We've gone back to a situation where except for the new Tridents for a short period of time, there are no doctors on board. We have very well-trained corpsmen and squadron, base, and fleet medical officers. Have you thought about that situation? Would you recommend to a physician friend of yours that he put himself into submarine medicine?
Ebersole: I think I would but I wouldn't, however, like to see a trained medical officer, perhaps at random, go for the first year of operations of any new class of submarines. I hope I'm wrong but I don't think we've solved all the atmospheric problems. The question of the incidence of different diseases among former submariners still bothers me. On an anecdotal basis I know what's been happening to some of them including myself. I would like to see that done. I don't think we should go to one medical officer for every ship. I don't think we can do that. I don't think the output of medical schools will support that, but I do think that from time to time we should send a

trained submarine medical officer to sea for at least a year on a new construction to see if there are any new problems and if we have solved all of the old problems.

Bornmann: That's what they're doing with the Trident but it isn't sufficient. We found this out by sending doctors on board the ASRs for diving. They don't know what they're doing out there and then it's just lip service without understanding the requirements. I had an ASR skipper tell me one time that he'd much rather have an emergency room surgeon or an orthopedist go with him than a submarine medical officer because the problems he had were sailors falling down ladders or getting their fingers caught and squeezed.

Ebersole: On the other hand these people wanted general medical officers. The line officers and crews wanted somebody who could take care of chicken pox, bruised fingers, and so on. But the general medical officer as good as he is may miss some of the things we want to pick up from new construction. So, my answer would be let's do as good, in my case, let's train them with the right emphasis by the way--not all radiation. It has to be some other things too, but let's let them ride these boats for a year or so and let's give them equipment this time. Instead of these little detectors, let's give them mass spectrographs. Let's get scientific about the ability to deliver clean air.

Bornmann: Another problem they had during the doctor draft and the Polaris crews was they would recruit officers and send them to submarine school and have a vacancy occur and they'd pluck people right out of the middle of the submarine course and send them to sea. So, they're getting extra pay. They're getting submarine pay 3 or 4 months early and they haven't had the training which BUMED has certified be necessary before you be a successful submarine medical officer.

Ebersole: This is very real, but it happens. You have doctors jerked out early and put on patrols. I had a commanding officer who told me: "You do a good job." I see it like this at this point. I realize there are problems in recruiting and in timing, but I would like to see us hang on to this business of atmosphere control. I don't think it's given a high enough priority by the line.

Bornmann: And it's not an engineering judgement. The collecting of information could be an engineering task but you've got to have someone who is familiar with the medical systems of the body they analyze.

Ebersole: Right. Mass spectrographs. When I first saw about half a block in size. Chromatography that sort of thing [?] just possible.

Herman: They're not doing that now?

Ebersole: I don't think so.

Herman: I was up at NSMRL about 4 or 5 years ago to just find out what they were up to. They had one study underway at the time where they were testing submarine atmosphere to determine what would be the lowest concentration of oxygen they could have and still maintain life and reduce flamability. You said 21 percent and they were talking somewhere in the range of 21 percent. They were doing tests with candles. When will a candle stop burning? Can you sustain life? Can you actually get along with that little oxygen on a boat? They were doing that kind of work and they were also checking for trace gases and

that type of thing. But it didn't seem universal. It seemed like they were only doing it in a very small study.
Ebersole: I pulled a trick one time on *Seawolf* in order to get another day or so of submergence time. Increase your pressure on the boat. You increase the total pressure and you increase the marginal[?] pressure of oxygen.

Bornmann: With a diminished percentage?
Ebersole: Yes. The percent of oxygen is down where you were breathing 19 or 18 percent. But that's at nominally 760 millimeters of mercury total atmospheric pressure. Now, bleedarian(?) to increase your total pressure. It's no longer 760; it's 800. Now, it's 18 percent of 800, not 18 percent of 760 anymore. So, you've increased the pressure of the oxygen which is the only thing that is important as far as O_2.

At the same time, you increase the pressure of CO_2. Fortunately the scrubbers, at least in those days, worked better when you increased the pressure(?)pressure. Now there comes a time when you have to bleed down.

Bornmann: And everybody goes unconscious.
Ebersole: I remember standing by the atmosphere enlarger as we came up after 30 days. They didn't get those hatches opened quite in time. So, those were some of the tricks you used. But back to my original statement, I would still train them and put them on board. If we build a *Seawolf* class, on that first boat I'd put a doctor on board for a year.

Herman: It was the same situation with you on the *Nautilus* wasn't it?
Ebersole: No, they had a doctor-- Dobbins--relieve me on *Nautilus*. I don't know what they had after him, after the boat crews. I don't think we can afford a doctor for every submarine. I don't think it will happen. Do you?

Bornmann: Except in wartime or major combat, we've never had that on any ship in the Navy. During the war we had doctors on every destroyers as far as I can tell and on most of the LSTs. That was an emergency measure. Submarines nowadays are so much bigger than they were during the World War II. I agree with you I cannot concur with these individuals who say they wouldn't recommend people go to medical school or the Navy. They say there's no requirement for a medical officer to be attached to the fleet. I think it's a great career.
Ebersole: I agree. I thought it was the happiest time in my life.

Bornmann: But you also have to utilize your corpsmen, be involved in setting the requirements for their training, testing them to make sure they know what they're supposed to know, supervise them, and encourage them to do what they can and are trained to do, and then as you say be on alert for medical problems that may be unusual and may escape recognition.
Ebersole: Yes. I set up a program in it last(?). MRL. You may have noticed I was very much impressed with the MRL's (Navy Research and Lab) ability because they had the equipment. All I could do was collect the sample, seal it up, and turn it over at the end of the crews.

Bornmann: What was the guy's name who had the long curled up mustache. He was really one of the strong points of the program. He's now in fire prevention. He's gotten out of closed atmosphere. He may have even retired. I haven't spoken to him in about 6 years.
Ebersole: I know who you mean. Also they were very quick to report things--trace benzene, 22457--that sort of thing.

Bornmann: Well, they're an outstanding lab and their record shows it for the past 60 years.
Ebersole: Let's see. We've covered the Kennedy thing. In 1968, I had served 20 years as a medical officer. I and three other captains put letters in to retire. We were suddenly told without any previous information that the Navy had changed the contract. The contract being that if you accepted your first stripe, you'd stay in for two years. We'd unilaterally changed it to four. You owe us two more years. I was not terribly upset by that; my wife was, but I wasn't. Bob Bernard, out of Philadelphia, had already put money down on our office in the Chicago area. So, he got a telephone call for us--Dr. Asapilots(?), Oegony(?), Dr. Frank Lenahan, Dr. Bernard, and myself--the four of us on a conference call.

Bornmann: Two submarine medical officers?
Yes. Dr. Bernard had been in submarines, but non-nuclear. I said to Bernard, "Let's sue."

"Come on. Before we get permission to sue, let's have the two years in." In addition, I have to admit I wanted a little more time to look around, So, (?) the conference call. Interesting thing. Frank Lenahan was in years later. He decided to stay in after all.

Bornmann: Was it a legislative change?
Ebersole: I don't think it was legislative. I think it was simply a decision at the BUPERS level. Certainly the line had to put 4 years in after the acceptance for years, but we were two years at the time. Remember the time of...
Bornmann: This is something new in the Staff Corps; it's only been since about 1945 or 1946. What would you feel if you were told that you had to put in 30 years for a normal retirement in Medical Corps? Would you enter the Navy?
Ebersole: No. I wanted to be able to practice my clinical specialty in civilian medicine for some period of time and I did for 17 years. I think that going to 30 years would turn me off. Let me say, however, I did receive credit for 27 years although I actually served only 22 years as a doctor. I was in the reserve component. Initially an active duty of E-12. Then following E-12, I asked to be put into an inactive reserve. So, the bottom line on the monthly check is based upon my service from 1943 - 1970. Simply because I said at Great Lakes when they were kicking us out at the end of World War II, "Yes, I want to go into the reserve." The guy ahead of me didn't but I said yes I will.

Bornmann: And your paycheck while your were on active duty was based on the same beginning point.
Ebersole: Apparently.

Bornmann: I understand that has changed for the retirement now. But if they had given you a congenial place in which to practice your medical specialty, at a naval hospital, on a dependent population, would you?
Ebersole: Yes. I wasn't given any of the state-of-the-art equipment which in my specialty is extremely important.

Bornmann: But if they had a first rate treatment center.
Ebersole: I would rethink that. Certainly, when I was chief, radiology, the radiation therapy section did not have state-of-the-art equipment.

Bornmann: How about your diagnostic equipment?
Ebersole: Diagnostic was in pretty good shape due to the man who was chief before me. Up to him, we did not have image intensifiers. But let me bring up one aspect of this. Image intensification was state-of-the-art in 1959, no question about it; things came later of course. But let's talk about 1959 when I started my residency. It was all old fluoroscopic equipment. They had already had image intensifiers all over Lancaster in 1959, the first one being at a high-powered dental clinic. But, I might rethink that given the way you stated it--a civilian population, state-of-the-art equipment, and leave me alone administratively. I got tired of wearing those four hats--medical school, REEL (Radiation and Exposure Evaluation Laboratory) building which was a big building put on the side of the Isotope lab with two body counters, hospital.

Bornmann: Who were your patients at the REEL building?
Ebersole: The building was set up on a dikking(?) the idea of it being a building to quickly evaluate radiation exposure. Among other things, the rooms were lined with battleship steel fabricated prior to Hiroshima. So we had no high back on contamination. These rooms also ringed with detectors so you could put somebody in there an hour or so and you'd get a whole body count. Then you could break it down with a gamma spectroscope and find out what it was. Before I retired, I went through it. Couldn't find anything. I thought I might've picked up some stuff Chocalate Buchanan(?) but I didn't or at least it had disappeared by that time. So that was the real building. I don't know if it's still functioning or not.

Herman: You said something interesting. It was pre-Hiroshima. From that point on, following atomic weapons, there was going to be some background radiation that had not existed before?
Ebersole: There was going to be an increase. There's always been background radiation but more so.
Bornmann: Not necessarily from Hiroshima but the atmospheric testing spread far all around the world. We even detected it at the South Pole when I was there in 1958. We were doing sky readings and we could see the isotopes appear in the ionosphere.
Ebersole: Prior to that time an air burst was considered to go up, tear through the stratosphere, and uniformly deposit over the world. The air burst at Bikini taught them an awful lot. Yes. It goes up but it's brought back down through disruption troposphere. The same disruption causes the prevailing winds. It sectored back down. When you get up there, it's supposed to be uniform but it's not because you're going to sneak it in and there still disruption in the troposphere and deposit it 40 to 60 degrees north or south latitude. Forty to 60 degrees north. Look on your map. It's a big agricultural area. Much more ocean in the south. New Zealand would take a hit and Chile. There a lot of water there, too. This we learned at Bikini and since that time, I think everybody's been a little shaky about projected models.

Put into the academic program I believe at Reed College and then presented him to ADM Rickover who realized then in-and-out part of it, said, "No, I don't want him." So, Sherman(?) never did serve in a nuclear fleet. I knew him because he was a fellow resident at Bethesda but the in-and-out(?) place didn't work. I figured I had this guy all trained and Rickover will take him right in and Rickover said no to the programs for no apparent reason. This was after all the training--the Reed College courses, etc.

Herman: Was it simply a matter that Rickover did not have that first choice?
I think you're right. "This is my business Albert you stay out of it."

Bornmann: My personal impression is that Rickover was deliberately provocative. He probably called BUMED because he somehow sensed that you would think it was insulting and he wanted to see how you would react to being insulted. This bit about sending Sherm Garrison away, I'm sure Rickover didn't care. He wasn't paying for it but he just thought it would be a lot of fun to turn him down and see what happened. I don't know Dr. Garrison reacted personally but I doubt that he felt bitter or short-changed.
Ebersole: I think later on he did a residency in radiology and ended up as a civilian near Portsmouth, VA.

Herman: So the training came in handy anyway?
Bornmann: This bit about prerogative(?) is something that gets in focus. I know about the Navy making a mistake. They sent out invitations one time inviting people to a ceremony where RADM So and So would relieve RADM So and So as Chief of Naval Research. And it's a statutory (?) and they did not have the approval of the congressional oversight. And they said maybe they won't notice. Just keep quiet and see whether they approve it and if they approve it then we have no problem. Two weeks away from the ceremony and they realized that not only had they not approved it, it wasn't even on the schedule, they weren't even warranting it. Obviously, it was deliberate. So, they sent the SECNAV's aide over to call on Senator Stennis from Mississippi. The Senator said, "Captain what can I do for you? Delighted to see you. It's always a pleasure but you obviously have something on your mind." The captain said, "Senator, I'm here to apologize. The Navy has made a terrible mistake."

"What mistake is that?"

"Well, somehow we slipped up and we left out that we would like to have So and So approved as Chief of Naval Research."

He said, "You did. I didn't know about that. What's the problem?"

"Well, Sir, we cannot do it until you approve it." He said, "It's up to me?"

"Yes, sir, it's up to you. We cannot do a thing until your committee stamps."

He said, "I didn't realize that at all" and then says, "I now see what the problem is." He calls in his personal assistant and says, "The captain says that the Navy cannot move without my approval of this ADM So and So. What are we doing about it?"

"Well, sir, do you want me to schedule it?" "Schedule it? I want it approved. We can have it approved tonight. Let's approve it tonight as just a favor to the captain."
Ebersole: I knew Sherm Garrison well, I helped to train him as a matter of fact. I don't think there was anything when Rickover started the show except "I'm in charge. I've got the right of refusing and if you don't acknowledge my right." There had been no interview of Garrison. He just popped into Reed College on the (?).

Herman: That seemed to major aspect of Rickover's personality. The interview was a major part of the way things were done. You had to be personally approved.
Bornmann: You had to be center stage, front, but it was not a major part.

Herman: But it was part of the ritual. Not that it was important in itself but it had to be done. It was the ritual of him putting his stamp of approval on every member.
Ebersole: And there were mistakes made. USS *Seawolf* pulled into Key West and one of the people that we wanted to have on board was a young line officer, ex-Navy Academy, who had been to see ADM Rickover who had been accepted into the program. He was arrested. A couple of days later, we were still there. He liked getting his challenge breaking into hardware stores and bicycle shops. I think they found about 20 bicycles in his apartment. He would steal them.

This guy I told you about who was relieved from duty in New London and they sent his photographs to Stanford to confirm that he was an MD. He was approved by Rickover.

The reason the system worked was that all the candidates were preselected. You'd send him 20, he'd pick 10. It didn't make any difference which 10. Normally they'd send him 12 and he'd pick 10 or 11 of them. Another reason the system worked is because Rickover had a better understanding of the real requirements in terms of people. He knew the ship completion schedule. He knew what a medical officer would require. The people in the Surgeon General's office had to guess whether it was 8 or 10 or 12. They'd struggle. Harry Alvis had a terrible time. Even Duckter(?) had a hard time. But they'd be told the quota was 12 and they'd only have nine and they'd be sweating blood. Rickover knew he only needed eight because he had a year delay up in New London first. But, he wouldn't tell anybody because he liked to see people sweat or swim.

Herman: It was interesting to see how his career ended. I don't whether it was the Secretary of the Navy, John Lehman, who was the only one who could have essentially gotten rid of him.
Bornmann: What happened was that Rickover's power came from his longevitiy. He had carefully cultivated politicians, congressmen, and senators who had risen with him to positions of authority and he also got himself into a position halfway between the ADC (?) and the Navy. So, he had the Navy by the balls because of this duplicate appointment. He also had the Secretary of the Navy in a good position because of his influence with the committee heads in the Senate, but he wouldn't quit. And as he got older and older, his supporters got older and older and they start resigning, not getting reelected, and dying. Pretty soon, the Congress that kicked him out was the Congress that kicked themselves out. The people said Washington is in a mess. We've got to do something about it.
Ebersole: I would guess that in the first year of operation of *Nautilus*, 50% of our operations were taking representatives and senators to sea. *Seawolf* took Eisenhower to sea, [Orval] Faubus from Arkansas.

Bornmann: I'm trying to make a list. Eisenhower was president and he went to sea on the *Seawolf* out of Newport, RI. Was that classified?

Ebersole: I don't think that was classified.

Bornmann: Teddy Roosevelt was the first Chief Executive to go out on a submarine. Pulkado (?) went out on a submarine and the Prince of Wales or the Duke of York went out and then later became King.
Ebersole: Yes. I remember it was during a time when Governor Orval Faubus had called up the troops or whatever in Arkansas on the race issue. He boarded us off Newport. He had his

medical officer with him. I remember Ike had cardiac problems and so on and he had the old Army general which was fine because I didn't carry any geriatric medication at all. But there were no problems.

Herman: What do you remember about that crews with him. Did you converse with him at that time?
Ebersole: Yes. He talked to us all. You know the Navy had really come through and the reason for that was because Sputnik had just flown. The Navy had really come through for us. The *Nautilus* had done the North Pole. Eisenhower was very friendly. I think he had lunch with the crew and dinner with the officers.

Bornmann: How long was he aboard?
Ebersole: He was only aboard for one day. He didn't stay overnight.

Herman: Were you ever out when Rickover came aboard and did his routine? What was that like? I've heard stories.
Ebersole: We'd get ready days before he came. Everything had to be perfect. I'd have a box of brandies (?) ready for him and there were special jackets for him.

Herman: Did he insist on taking control of the boat himself?
Ebersole: Yes. One time he took control of our planes. You have bow planes and stern planes and a man at the helm. You have three men across. We were supposed to be something like 200 feet or 150 feet. He took the power plane and rammed them over. They got out of the way. Just behind him was a diving officer who would immediately grab the power plane, but that was the sort of thing he'd pull.

One time we had to take a group of senators out. Among them was the old Gore, Albert senior.

Bornmann: The father of the Vice President.
Ebersole: He was senator at that time and he was on one of the committees. He chewed tobacco on a clean deck. Later the enlisted men gave him a rag and said, "Clean it up, Senator." And he did. I would say at least 50% of our operations were good trips. That was how it worked because you needed funding to expand your enterprise. On these trips, we never had any claustrophobia or anything like that. No anxiety attacks. I always expected that to happen.

Bornmann: Probably the ones with claustrophobia excluded themselves. I'm sure there were a number who didn't make it at the last minute because of a conflict.
Ebersole: I'm still thinking of who it was who came on board on the weekend and took one look around the ward room and said, "This is not for me."

Once we went into a town which was a tiny little village with a dry dock. The place was almost in Cornwall. We went into town and there was a second engineer on board a tanker which was up in the dry dock who had a car. He volunteered to drive us back to the submarine because he was going that way. We excepted because that way we didn't have to pay cab fare or walk. When we got to the dock yard, the captain invited him aboard for a drink. He went down into the submarine wardroom and he looked around. It was a mess. We got there around 11 o'clock. We all crammed into this room and sat down. The guy looked around and said, "How many people did you say live in here?"

"Normally, six but with the doctor on board there's seven of us."

He said, "I don't want to make anybody mad but my shitters are bigger than this.”